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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,880	03/19/2004	Kazuhiko Oda	119168	7150

25944 7590 01/25/2008
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EXAMINER

VIJAYAKUMAR, KALLAMBELLA M

ART UNIT	PAPER NUMBER
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1793

MAIL DATE	DELIVERY MODE
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01/25/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/803,880	Applicant(s) ODA ET AL.	
	Examiner Kallambella Vijayakumar	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3,5,7,11,13,15,17,22-28 and 30-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3,5,7,11,13,15,17,22-28 and 30-34 is/are rejected.
- 7) ☒ Claim(s) 5,7,27 and 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 3, 5, 7, 11, 13, 15, 17, 22-28 and 30-34 as amended are currently pending with the application. Claims 1-2, 4, 6, 8-10, 12, 14, 16, 18-21 and 29 were cancelled. Claims 11 and 15 were amended. Claims 31-34 were newly added.

Claim Objections

Claims 5, 7 and 27-28 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. These claims do not further limit the particle size of the ceramic in claims 11 and 15.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 3, 5, 7, 11, 13, 15, 17, 22-28 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kang et al (US 5,296,189).

Kang et al teach making a grain growth control adhesives for a conductive paste containing metal (Cu) particles mixed with additive particles such as alumina by jet impact milling of the particles. The prior art teaches that the alumina particles of desired size and quantity can be mixed with copper powder and subjected to high energy milling in a ball mill to achieve intimate mixing (Abstract). The starting size of the alumina particles was from about 0.05 to about 0.1 micron. The starting size of the copper particles was from about 2 to about 5 micron (CI-4, Ln 35-40; CI-5, Ln 25-37). The milled particles were reduced in size in a jet mill using opposing streams of a suitable fluid <slurry> (usually compressed air or other inert gas such as nitrogen) carrying the material to be pulverized, are made to collide in an impact chamber

until their average size distribution reaches a much finer range (CI-5, Ln 47-59). Further fluids include liquids and gases. Metals included Cu, Ag, Au (CI-8, Ln 23-24).

The prior art fails to teach the metal particle size to be less than 0.5 micron and the wetting undried metal particles having been water washed metal particles in claims 11, 13 and 15.

However the prior art teaches that desired particle sizes could be used (CI-3, Ln 65-CI-4, Ln-3), and it would have been obvious to a person of ordinary skilled in the art to use finer particles of metals as a choice of design of operational function of the jet mill, because generally, differences in concentration or temperature or particle size will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature or particle size is critical.

"[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

The examiner asserts that the treatment of the prior art metal particles in a fluid will be substantially same as applicants wetting of undried metal particles. The omission of drying the wet metal particles in the instant claimed process step will be prima facie obvious over the particles used by the prior art in the slurry, because Omission of an Element/step and Its Function Is Obvious If the Function of the Element Is Not Desired Ex parte Wu , 10 USPQ 2031 (Bd. Pat. App. & Inter. 1989) <MPEP 2144.04>.

With regard to claim-13, the prior art particle size of 0.05 micron size for alumina that further meets the limitation of ceramic particle size with relation to the metal particle size in claim-13.

With regard to claim-15, the prior art teaches copper as an example of a metal in conductor paste, and it would have been obvious to use nickel in place of copper as functional equivalent in the process and composition of Kang et al with reasonable expectation of success, because it was well known to form conductor paste containing nickel and ceramic powder (See Takeuchi, US 4,551,357) and prior art teaches metal conductor paste.

With regard to claims 3, 22 and 26, the prior art teaches colliding opposing streams of the fluid dispersion of the particles, and the composition of opposing streams will be substantially the same.

With regard to claims 5, 7, 23-24 and 27-28, the prior art teaches an alumina particle size of 0.05 micron.

With regard to claims 17, 25 and 30, the prior art teaches a conductor forming paste. The use of phrase "to form an electrode on ceramic dielectric substrate" in the claims have not been treated with patentability. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

2. Claims 3, 11, 15, 26 and 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Serafin et al (US 5,852,076).

Serafin et al teach a method of making magnetic dispersions and other dispersions of hard, non-compliant particles such as magnetic pigments such as iron oxides, alumina (ceramic), magnetic metal particles and color pigment particles, wherein the process stream is split in to two or more streams and recombined after passing through restrictive orifices (0.1-1 mm) configured for the streams to impinge on each other at high velocities at various angles of contact (Abstract, Fig-2, CI-3, Ln 23-30, 40-43; CI-5, Ln 16-22; CI-5, Ln 47-58). The agglomerates of the process stream was finer than 60 mesh size and further teaches that the orifice size could be adjusted if the particle sizes vary (CI-6, Ln 41-44). The claimed conductivity will be obvious over the electrical conductivity of magnetic metals such as Fe, Co and Ni and their alloys.

The prior art fails to teach wetting undried metal particles having been water washed metal particles and silent about the metal particle size per the claims 11, 15 and 33-34.

However, the prior art teaches forming a slurry and splitting the streams to impinge on each other, and the examiner asserts that the treatment of the prior art metal particles will be substantially same as

applicants wetting of undried metal particles. The omission of drying the wet metal particles in the instant claimed process step will be prima facie obvious over the particles used by the prior art in the slurry, because Omission of an Element/step and Its Function Is Obvious If the Function of the Element Is Not Desired Ex parte Wu , 10 USPQ 2031 (Bd. Pat. App. & Inter. 1989) <MPEP 2144.04>. With regard to particle size, the prior art teaches processing agglomerates up to about 60 mesh size (i.e. up to 250 microns) and the presence of fine particles including 0.5 micron metal particles in this slurry would be obvious. With regard to claim-15, it would have been obvious to a person of ordinary skilled in the art to select Nickel in the slurry from a limited number ferromagnetic metals such as iron, cobalt and nickel in the process of Serafin.

With regard to claims 3 and 26, the prior art teaches splitting a process stream to more than one stream that impinge on each other, whereby the composition of different streams will be substantially the same. With regard to claims 31-32 and 33-34, the prior art teaches metal slurry in toluene, cyclohexanone and MIBK, and wetting of the metal particles with toluene or cyclohexanone would be obvious (CI-9, Ln 16-18; 39-42).

3. Claims 5, 7, 13, 23-24 and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Serafin et al (US 5,852,076) in view of Kang et al (US 5,296,189).

The teachings on the method of making magnetic dispersions and other dispersions of hard, non-compliant particles by Serafin et al as set forth in rejection-2 under 35 USC 103(a) is herein incorporated.

The prior art fails to teach the ceramic particle size per the claim 13 and the particle size ratios per the claims 5, 7, 23-24 and 27-29.

In the analogous art. Kang et al teach making compositions containing metal particles mixed with additive particles such as alumina by choosing desired size and quantity of alumina mixed with copper powder, premixing in a high energy milling in a ball mill (Abstract) and milling the particles in a jet mill using opposing streams of a suitable fluid <slurry> that are made to collide in an impact chamber until their average size distribution reaches a much finer range (CI-5, Ln 47-59). Further fluids include liquids

and gases. The starting size of the alumina particles was from about 0.05 to about 0.1 micron. The starting size of the copper particles was from about 2 to about 5 micron (CI-4, Ln 35-40; CI-5, Ln 25-37).

The particle size of ceramic alumina and the ratio of the particle diameters of the components in the process of Serafin et al would be obvious over the teachings of Kang et al, because the process of making dispersions of hard particles comprising genus of magnetic metals and alumina ceramic encompasses the species of paramagnetic Cu and alumina ceramic of Kang, and the prior art teachings use common jet-milling in making the composition.

Response to Arguments

Applicant's arguments filed 10/26/2007 and discussed 11/13/2007 have been fully considered but they are not persuasive. With regard to the argument that Kang teaches drying of the particles (Res, Pg-8, Para-2), that is correct and applicants fail to overcome the obviousness rejection cited over this in the last office action. With regard to the sheet density and the smoothness of the particles in Table-1, they are not the limitations of the instant claims (Res, Pg-8, Para-4). Further, with regard to the unexpected results over the undried metal particles and the particle sizes in table-1, they were obtained with Ni particles with 0.4 micron size which are coated with a surfactant, precipitated out and slurried with 0.1 micron barium titanate in a solvent and dispersed by collision dispersion that is not commensurate with the scope of the instant claims.

For the reasons set forth above applicants fail to patentably distinguish their process over the prior art methods.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

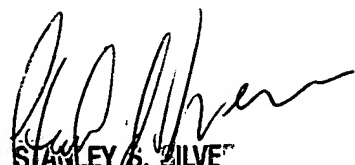
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on 6.30-4.00 Mon-Thu, 6.30-2.00 Alt Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KMV/
January 20, 2008.


STANLEY S. SILVERMAN
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TECHNOLOGY CENTER